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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE GOOGLE PLAY CONSUMER ANTITRUST LITIGATION

RELATED ACTIONS:

Epic Games Inc. v. Google LLC et al., Case No. 3:20-cv-05671-JD

In re Google Play Developer Antitrust Litigation, Case No. 3:20-cv-05792-JD

State of Utah, et al., v. Google LLC, et al., Case No. 3:21-cv-05227-JD

Match Group, LLC, et al. v. Google LLC, et al., Case No. 3:22-cv-02746-JD

No. 3:20-CV-05761-JD

CONSUMER PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE TESTIMONY OF DR. HAL J. SINGER ON CLASS CERTIFICATION

Hearing Date: August 4, 2022
Hearing Time: 10:00 a.m.
Courtroom: Courtroom 11, 19th Floor
Judge: The Honorable James Donato

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases

INTRODUCTION

Dr. Singer's expert report demonstrates through common evidence and well-accepted economic and econometric modeling that Google's anticompetitive behavior harmed tens of millions of consumers nationwide. Dr. Singer's report relies on two models that independently demonstrate common impact on these consumers: (a) one models the overcharge in fees (or "take rate") that Google has charged developers, and the consumer harm from the overcharge that developers have passed on to consumers; and (b) a separate model independently demonstrates consumer harm through increased subsidies Google would offer directly to consumers in a competitive market. Google's motion focuses almost entirely on the pass-through portion of the first model. Google's criticisms of Dr. Singer's pass-through model are without merit and do not warrant exclusion. Google addresses the direct consumer-subsidy model—which provides an independent basis for class certification—only briefly at the end of its motion. Those criticisms are also without merit. Both of Dr. Singer's analyses are reliable and support class certification.

In support of its motion, Google repeatedly mischaracterizes the record, case law, and Dr. Singer's words when it argues that the pass-through model is not generally accepted. Dr. Singer's pass-through model isn't novel and doesn't ignore marginal costs. The model is regularly used by antitrust economists to study consumer price impacts resulting from a change in costs—indeed, it accounts for the change in marginal costs as one of its variables. In addition, Dr. Singer confirmed that the model applies to this case by applying standard econometric techniques—uncontested by Google or its experts—to Google's own data. Unable to show that the well-established model used by Dr. Singer is unreliable, Google makes a series of misplaced arguments about the reliability of facts and assumptions made by Dr. Singer. But Dr. Singer's analysis is reliable, and Google's arguments are, at best, matters for cross examination, not exclusion. The Court should deny Google's blunderbuss motion challenging Dr. Singer's report.

BACKGROUND

Dr. Singer authored a comprehensive expert report and reply report in support of class certification, marshalling economic evidence of Google's anticompetitive conduct and its impact on consumers. Ex. 1 (Singer Rpt). Google focuses solely on Dr. Singer's analysis of antitrust

impact and does not challenge his qualifications or move to exclude his other opinions. Dkt. 282 (hereinafter "Mot."). To prove antitrust impact on a class-wide basis, Dr. Singer models two ways in which all (or nearly all) proposed class members would have benefitted had Google not undertaken its anticompetitive campaign to monopolize the relevant markets. Both analyses are reliable.

In his first model, Dr. Singer demonstrates common impact in a but-for world characterized by lower take rates for developers. Google does not challenge the methodology Dr. Singer uses to calculate Google's lower competitive take rates in a but-for world except to the extent those models rely on his pass-through model for inputs. Mot. at Part II.

Dr. Singer then calculates how the resulting *change* in developer marginal costs in the but-for world would impact the price of apps. Ex. 1 (Singer Rpt.) ¶¶ 222-44. Google's take rate—a toll that all developers pay for every sale—is a marginal cost for developers. *Id.* ¶¶ 224-25. Standard economics shows that if a firm bears higher marginal costs, it will pass on those costs to consumers by charging more. *Id.* ¶ 223; *see also* Ex. 4, N. GREGORY MANKIW, PRINCIPLES OF MICROECONOMICS 273, 285 (Cengage Learning 8th ed. 2018). In a competitive world, the take rate would have been lower, and developers would have charged less. Instead, the cost of Google's supra-competitive take rate was passed along to consumers as higher prices.

To calculate the precise amount of pass-through, it is necessary to know the demand curve faced by developers. Ex. 1 (Singer Rpt.) ¶ 223. Accordingly, Dr. Singer ran regressions—which, again, Google does not challenge—to determine that a logit demand system accurately reflects the demand curve Android developers in each of the app categories used by Google Play face. Ex. 1 (Singer Rpt.) ¶¶ 236-38. Armed with this knowledge, Dr. Singer used the standard formula for calculating the profit-maximizing pass-through rate for a developer facing a logit demand curve. Ex. 1 (Singer Rpt.) ¶¶ 239-40. Google derides this formula as overly simplistic and suggests it is Dr. Singer's invention, Mot. at 4,[1] but the formula is derived from the logit demand model in peer-reviewed literature—*as Google's own expert admits*. Ex. 1 (Singer Rpt.) ¶ 239; Ex. 5 (Burtis Dep.) 187:3-189:13 (discussing Ex. 6, Nathan Miller, Marc Remer, & Gloria Sheu, *Using cost pass-*

[1] Google twice claims that Dr. Singer proffered a "'deceptively straightforward' model." Mot. at 2, 9. Dr. Singer actually said that Google's expert ignored "the calculations that work in the background to produce a deceptively straightforward result." Ex. 2 (Singer Reply) ¶ 68.

through to calibrate demand, 118 ECONOMICS LETTERS 451 (2013) (PX937)). Applying that formula, Dr. Singer calculates pass-through for each of the 35 app categories used, and optimized by, Google in operating its business. Ex. 1 (Singer Rpt.) Table 8.[2]

In his second model, Dr. Singer demonstrates common impact through increased consumer subsidies Google would have provided to consumers but for its unlawful conduct. Ex. 1 (Singer Rpt.) ¶¶ 245-56. Google does not argue that Dr. Singer's model should be excluded because it is not generally accepted in the field, or that there are flaws with his calculation showing an increase in consumer subsidies from [redacted] per transaction to [redacted] per transaction. Mot. at 14-15. Instead, it argues that not all consumers value rewards in the same way—an argument that could be made for any consumer benefit, including even money.

ARGUMENT

I. Dr. Singer's Direct Consumer Subsidy Analysis Is Reliable and Supports Class Certification Even Absent His Pass-Through Analysis

Dr. Singer's analysis of consumer impact through increased consumer subsidies via the Play Points program is a reliable methodology for calculating class-wide antitrust impact without the need to consider pass-through. Ex. 1 (Singer Rpt.) ¶¶ 245-56. Google does not take issue with the modeling that Dr. Singer performed, but rather argues that Dr. Singer's opinion is unreliable solely because he did not model the percentage of consumers who would have signed up for and used Play Points in the but-for world. Mot. at 14-15. Both of Google's arguments miss the point.

First, Google's argument that Dr. Singer must show every user would sign up for Play Points in the but-for world is a factual dispute for cross-examination recast as a methodological failing. Google argues that the [redacted] participation rates from the opt-in model Google currently uses mean that Dr. Singer must model such participation in the but-for world. Mot. at 15. But as Dr. Singer explained, the Play Points subsidy "[redacted]" and it is unsurprising that consumers do not sign up for an average of "[redacted] Ex. 3 (Singer Dep.) at 293:21-294:9; 298:4-21. By contrast, standard economic principles suggest participation would be a non-issue in the but-for world. Play Points is already available to all consumers, with no minimum

[2] Google argues the model produces "very strange results" because prices can fluctuate from week-to-week or month-to-month but fails to note that only occurs if the model is applied over an arbitrarily short period, an error only Google's expert committed. Ex. 3 (Singer Dep.) at 131:23-134:9.

expenditure to join. Ex. 7 (Burtis Rpt.) ¶ 353. Google could automatically enroll users to a more fulsome program, just as credit card companies and other rewards programs already do. Ex. 2 (Singer Reply) ¶ 98. Even if Google maintained an opt-in model, an [redacted] discount, [redacted] the current discount, would drive near universal participation. *Id.*; Ex. 3 (Singer Dep.) at 297:8-298:12.

Google has not shown why Dr. Singer must account for current low participation rates—an artifact of Google's exclusion of competition that would have spurred it to compete for consumers—through separate economic modeling. *See In re Mushroom Direct Purchaser Antitrust Litig.*, No. 06-0620, 2015 WL 5767415, at *6 (E.D. Pa. July 29, 2015) ("I am only to consider the reliability of the expert's method, which may properly include making assumptions so long as those assumptions are sufficiently grounded in available facts.") (internal quotation marks omitted). And courts have already rejected Google's premise that an expert must perform some sort of a study to determine how each separate consumer would value the same benefits that would result from competition. *In re Optical Disk Drive Antitrust Litig.*, No. 3:10-md-2143, 2016 WL 467444, at *9 (N.D. Cal., Feb. 8, 2016) ("Defendants' focus on the subjective desires of individual consumers is misplaced, and is not supported by legal precedent requiring any such approach.").

Second, Dr. Singer need not model redemption rates of Play Points to show antitrust impact. Even unredeemed points have "intrinsic option value," in that they still may be redeemed in the future, just as gift cards or cash may be spent in the future. Ex. 2 (Singer Reply) ¶ 99; *see, e.g., In re Online DVD-Rental Antitrust Litig.*, 779 F.3d 934, 952 (9th Cir. 2015) (acknowledging, in context of class settlement of antitrust claims, the intrinsic economic value to consumers of gift cards that provide a set amount of money to use on their choice of a large number of products). Consumers are better off with an [redacted] discount than without one.

Neither of Google's arguments faulting Dr. Singer for failing to separately model away low consumer participation and redemption in Google's current paltry Play Points program render his analysis unreliable. Dr. Singer reliably demonstrates the benefits of a more robust Play Points program, adopted in the face of fair competition, to all or nearly all class members, and this analysis alone is reliable and can support class certification without considering pass-through.

II. Dr. Singer's Pass-Through Analysis Is Reliable

Google's scattershot challenges do not undermine the reliability of Dr. Singer's thorough work described above.

A. Dr. Singer's Use of the Logit Model to Calculate Pass-Through of a Change in Marginal Costs Is Reliable and Regularly Used in Antitrust Economics

Although Google claims Dr. Singer's model of pass-through is not "generally accepted," Mot. at 6-9, it presents no direct support. Nor can it. The logit demand system used by Dr. Singer is a generally accepted economic method, as even Dr. Burtis concedes. Ex. 7 (Burtis Rpt.) ¶ 306 (logit models are "frequently used in economics"); *see also* Ex. 5 (Burtis Dep.) 187:3-7. Economic literature confirms that the "most widely used discrete choice model is logit" and that it is "the ideal rather than a restriction." Ex. 8 (Kenneth Train, *Logit, in* DISCRETE CHOICE METHODS WITH SIMULATION 34-75), at 34, 36 (cited by Ex. 7 (Burtis Rpt.) ¶ 306 n.363). Likewise, courts have approved economists' use of logit models to estimate price impact in antitrust and unfair trade practices cases. *Allegra v. Luxottica Retail North America*, No. 17-CV-5216 (PKC) (RLM), 2022 WL 42867 at *56-57, 60 (E.D.N.Y. Jan. 5, 2022) (denying motion to exclude analysis of deceptive trade practice on consumer prices based on logit model); *V5 Technologies, LLC v. Switch, Ltd.*, Case No. 2:17-cv-02349-KJD-NJK, 2020 WL 6688732, at *2 (D. Nev. Nov. 12, 2020) (denying motion to exclude testimony in antitrust case relying on multinomial logit model); *In re Dial Complete Marketing and Sales Practices Litig.*, 320 F.R.D. 326, 330-31, 333 (D.N.H. 2017) (denying motion to exclude testimony using logit models to calculate consumer demand for product feature).

Google cannot credibly claim that formulas derived from logit demand systems are unreliable for calculating pass-through. Dr. Singer cites a peer-reviewed paper using the same standard logit model to calculate pass-through of cost savings from a merger. Ex. 2 (Singer Reply) ¶ 77 n.150 (citing Ex. 9 (Gregory Werden & Luke Froeb, *The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy* 10(2) Journal of Law, Economics, & Organization 407, 419 (1994)). The logit model is "commonly employed in antitrust analysis of mergers involving differentiated products." Ex. 6 (Miller *et al.* (PX937)) at 452. Like in the merger context, Dr. Singer uses logit to examine how changes in costs impact consumer prices.

Unable to claim the logit model is junk science, Google instead derides the pass-through formula derived from the model as "bare bones." Mot at 2.[3] To make that argument, Google focuses solely on the *final* step of Dr. Singer's analysis, which calculates pass-through based on an app's share of a category, while ignoring the complex econometric work enabling and validating that calculation. Specifically, two key analyses—both unchallenged by Google—demonstrate the economic rigor that underlies Dr. Singer's pass-through calculation.

Dr. Singer first ran regressions on Google's real-world transaction data to confirm the demand curve faced by developers in the Play Store conforms to the logit model. Ex. 1 (Singer Report) ¶ 235. To make that determination, Dr. Singer ran regressions on an app-by-app level, treating each of Google's 35 app categories as a separate demand system. *Id.* ¶¶ 235-38 & Table 7. Those regressions determined that the logit demand model accurately described how actual historical price changes affected actual consumer demand within app categories. *Id.* In other words, the regressions show that when prices rose for an app within a category, consumer demand shifted to other apps in that category following the pattern predicted by the logit model. *Id.*

Once Dr. Singer determined the logit model was the right fit to describe consumer purchasing behavior, he turned to peer-reviewed literature to determine the profit-maximizing pass-through rate for each developer based on that model. *Id.* ¶ 239 (citing Ex. 6 (Miller *et al.* (PX937)) at 452-53). Starting from the basic proposition that firms maximize profit by setting marginal revenue equal to marginal cost, the article derives a formula from the logit demand system for how the profit-maximizing price *changes* as a developers' marginal costs *change*. Ex. 2 (Singer Reply) ¶ 72. These calculations, which derived the formula Dr. Singer ultimately used, consider all relevant economic variables, *including* price and marginal cost to arrive at the logit pass-through formula. Ex. 2 (Singer Reply) ¶¶ 71-72. That the final formula derived from this process is simple does not mean the underlying economics are simple, any more than the simplicity of $E=MC^2$ suggests that the underlying physics are invalid due to the simplicity of the final formula.

[3] Regardless, simplicity is no basis for exclusion. *Victorino v. FCA US LLC*, No. 16cv1617-GPC(JLB), 2018 WL 2767300, at *2 (S.D. Cal. June 7, 2018) (rejecting challenge to class expert because "[w]hile the mathematical formula … is a simple formula, it was created after careful review of the facts of the case, the theories alleged and consideration of different variables.").

B. Google's Other Arguments Against the Acceptance of the Model Are Misplaced

The majority of Google's arguments under the heading that "Dr. Singer's Pass-Through Formula Is Not Generally Accepted" do not relate to that question. Mot. at 6-9. These arguments are all misplaced and, at best, cross-examination points restyled as methodological arguments.

First, using cherry-picked deposition testimony, Google disingenuously argues that an equation cited in Dr. Singer's report, but not directly used by Dr. Singer to calculate pass-through, is "the model 'that's generally accepted in economics'" for calculating pass-through. Mot. at 6-7 (emphasis added) (citing Ex. 3 (Singer Dep.) at 105:8-106:3, 107:23-108:2). Google's motion ignores a crucial fact: that equation—which demonstrates how a firm calculates a profit-maximizing price—*cannot* by itself be used to calculate pass-through. Ex. 1 (Singer Rpt.) ¶¶ 224-25. Google omits that Dr. Singer explains why in response to the same set of questions it misleadingly quotes: "[W]hen I go to model the precise amount of pass-through, I have to make an assumption about what kind of demand the developer faces." Ex. 3 (Singer Dep.) at 106:4-107:22; *see also id.* at 113:5-114:2. In other words, to calculate the profit-maximizing amount of pass-through, an economist *must* choose a demand model, which Dr. Singer did with the logit model. One *cannot* estimate pass-through based on a generic demand curve.[4] Unsurprisingly, Google does not cite its own economist once in support of its argument that Dr. Singer should have used the equation in ¶ 224 to calculate pass-through. Mot. 6-9.

Second, Google repeatedly distorts the role marginal costs play in Dr. Singer's analysis. Dr. Singer does not ignore marginal costs. The logit pass-through formula considers marginal costs by measuring the *change* in developers' marginal costs. Ex. 2 (Singer Reply) ¶ 72 (citing Ex. 6 (Miller *et al.* (PX937)) at 452, 453). While the simplified pricing equation in ¶ 224 of the Singer Report includes the level of marginal cost, application of the logit demand model causes the absolute level of marginal costs to drop out of the equation, meaning the pass-through calculation depends solely on the *change* in marginal costs. Ex. 2 (Singer Reply) ¶ 71; Ex. 3 (Singer Dep.) at

[4] But even if the equation Google's motion argues should have been used could have model pass-through, the "choice of one particular data analysis method over another goes to the weight of his opinion, not its admissibility." *DZ Reserve v. Meta Platforms, Inc.*, Case No. 3:18-cv-04978-JD, 2022 WL 912890 at *8 (N.D. Cal. Mar. 29, 2022).

113:5-115:13. This makes sense because a pass-through rate is, by definition, the *change* in price resulting from a change in cost. Ex. 1 (Singer Rpt.) ¶ 239. As noted above, Google has not challenged Dr. Singer's choice of the logit model as unreliable, nor could it.[5]

Next, Google places undue significance on the distinction between per-unit costs (costs that are the same regardless of price) and *ad valorem* costs (expressed as a percentage of price) but can point to no basis in economics for that alleged significance. Google falsely claims that Dr. Singer's model is drawn from an article that "expressly states" its formulas apply to per-unit costs, not *ad valorem* costs. The article says no such thing. Ex. 6 (Miller *et al.* (PX937)) (presenting "[g]eneral model of cost pass-through" and, while applying it to a "per-unit tax," presenting no limitation to per-unit costs).

The distinction between *ad valorem* and per-unit costs theoretically matters only if a short-term profit maximizing firm faces *zero* marginal costs aside from the changing take rate. Ex. 2 (Singer Reply) ¶ 31. In fact, this is Google's only marginal cost argument with *any* support from its economist. Mot. at 6-9. But Google's own expert reports and economic literature show developers face other marginal costs like sales taxes, customer support, and processing costs of user information. Ex. 7 (Burtis Rpt.) ¶¶ 144-46; Ex. 10 (Anindya Ghose & Sang Pil Han, *Estimating Demand for Mobile Applications in the New Economy*, 60(6) MANAGEMENT SCIENCE 1470, 1474 (2013); Ex. 2 (Singer Reply) ¶¶ 21-25. Google has identified zero evidence that any developer actually faces zero marginal costs, and its expert is only willing to say that ***if*** developers have zero marginal costs, then a take-rate change is "less likely to lead to a change in the retail price of the app." Ex. 7 (Burtis Rpt.) ¶¶ 142-43; *see also* Ex. 3 (Singer Dep.) at 97:24-98:19 ("replication costs" mentioned in Mot. Ex. 5 are "not the same" as marginal costs). To the contrary, analysis of Google's data shows that taxes, another *ad valorem* cost, are typically passed on in full, inconsistent with Google's zero-marginal cost argument. Ex. 2 (Singer Reply) ¶¶ 23 & n.51; 244.

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[5] Google selectively quotes deposition testimony to suggest that Dr. Singer "went with" the logit model solely to evade calculating marginal costs, Mot. at 8. Dr. Singer's full answer notes it was one reason "among myriad other reasons" and was "not the only reason or the primary reason why I chose logit." Ex. 3 (Singer Dep.) at 195:20-196:24. Nor could it have been the reason. *All* of the demand models in the article cited by Dr. Singer find that the pass-through rate depends on the *change*, and not the *level*, of marginal cost. Ex. 6 (Miller *et al.* (PX937)).

Third, Google's invocation of *Illinois Brick* is a red herring and gets it nowhere. *Illinois Brick* does not bar Dr. Singer's analysis here, because the Supreme Court has held that app store consumers are direct purchasers who may recover under the federal antitrust laws. *Apple v. Pepper*, 139 S. Ct. 1514 (2019). As direct purchasers, consumers are "entitled to the *full amount* of the unlawful overcharge," because "[t]he overcharge has not been passed on by anyone to anyone." *Id.* at 1525 (2019) (emphasis in original). It is Google's burden, not Plaintiffs', to demonstrate that some portion of the overcharge would not affect consumer app prices. *Id.* at 1523. Nor did *Illinois Brick*—as Google suggests—reject the proposition that overcharges are an equivalent to an excise tax. Mot. at 9. To the contrary, it explained that "an overcharge *can* be calculated using the economic theorems for the incidence of an excise tax." *Illinois Brick Co. v. Illinois,* 431 U.S. 720, 741 n.25 (1977) (emphasis added).

Fourth, Google suggests the model fails to account for developers who would invest in their product with savings from a lower take rate. Mot. at 8-9. That is misdirection. Dr. Singer's models are agnostic to how developers choose to use the portion of savings that are not passed through to consumers. Ex. 1 (Singer Rpt). ¶ 266. The logit model predicts pass-through rates ranging from [redacted] in each app category. Ex. 1 (Singer Rpt.) at Tables 13 & 14. Developers could reinvest some or all the remaining [redacted] of savings, or pocket it as profit—Dr. Singer's modeling is not undermined by either outcome. And, in any event, Google's argument that an economist must model whether increased costs are passed along in the form of higher prices, or instead result in decreased investment in product development, would effectively exclude the expert testimony in myriad antitrust cases where economists have shown consumer impact in the form of higher prices.

C. Dr. Singer's Pass-Through Model Is Based on Reliable Data

Most of Google's challenges to Dr. Singer's pass-through model concern facts Google claims he failed to consider and assumptions Google claims he made. But those are not a basis for exclusion. As this Court recognizes, "[t]he appropriate concerns at this stage are not about the quality of the data [the expert] used or whether he included all potential variables in his model… Those observations may be grist for a good cross-examination at trial, but they do not play a

material role" in *Daubert*. *In re Capacitors Antitrust Litig. (No. III)*, No. 14-CV-03264-JD, 2018 WL 5980139, at *6 (N.D. Cal. Nov. 14, 2018); *Hemmings v. Tidyman's Inc.*, 285 F.3d 1174, 1188 (9th Cir. 2002) ("[I]n most cases, objections to the inadequacies of a study are more appropriately considered an objection going to the weight of the evidence rather than its admissibility.").

1. Dr. Singer Considered Real-World Data

Google wrongly contends Dr. Singer ignores real-world data. In fact, Dr. Singer considered and used the available data to the extent it was reliable—and he considered and rejected unreliable data and assumptions (as economists regularly do).

To begin, Dr. Singer did not use his "typical" approach of "regressing retail price changes on wholesale price changes," Mot. at 9 (citing Ex. 3 (Singer Dep.) at 134:25-135:6), because wholesale pricing data simply does not exist for Google Play. Ex. 3 (Singer Dep.) at 136:13-20.

Google also complains that Dr. Singer failed to credit Google's expert's and the developer class certification expert's analyses of price reductions following limited take rate reductions in 2018 and 2021. As explained in Dr. Singer's reply report, methodological failures infect Dr. Burtis's analysis of the 2018 and 2021 changes. For example, Dr. Burtis's analysis of the 2018 take rate change—which applied only to second-year subscriptions—ignores that Google Play provides no mechanism for a developer to change second-year subscription prices. Ex. 2 (Singer Reply) ¶ 122. Dr. Burtis's analyses also are infected by numerous other flaws, including failure to measure over a sufficiently long-time horizon, failure to include a control group, and reviewing changes over artificially small product-groups rather than by app or developer. *Id.* ¶¶ 102-33. At best, the analyses demonstrate price stickiness, which would benefit the class in the but-for world where a competitive take rate would have been set at the outset. *Id.* ¶ 115. More fundamentally, Google's average overall take rate remained near constant throughout the class period, despite Google's minor changes in 2018 and 2021, providing almost no basis to examine more significant changes in take rate that would result from full competition. Ex. 3 (Singer Dep.) 138:16-141:12.

Contrary to Google's suggestions, Dr. Singer tested his model on significant actual data, running regressions on Google's transaction data to determine that the logit model was a good fit. Ex. 1 (Singer Rpt.) ¶¶ 237-38. He analyzed developers' experience with sales tax to confirm that

developers pass through costs to consumers. *Id.* ¶ 244. And he analyzed pass-through from the limited number of major developers who can effectively offer lower prices on their websites in spite of Google's anti-steering restraints. *Id.* ¶¶ 242-43 & Table 9. As evidenced by Dr. Burtis's failures, broader real-world experiments are not possible because of Google's continuous anticompetitive conduct. Ex. 2 (Singer Reply) ¶¶ 112-15. A but-for world characterized by steering, permanent widespread lower take rates, and other pro-competitive benefits would facilitate pass-through, resulting in a competitive price for the consumer. *Id.*

Finally, Google's claim that Dr. Singer relied on no developer testimony is, once again, false. Dr. Singer relied on trial testimony in *Epic v. Apple* from Match.com's Adrian Ong confirming that increased costs from Apple's take rate led to higher prices. Ex. 1 (Singer Rpt.) ¶ 227 & n.501. And testimony from Dan Scalise of Rescue Pets, a developer class representative, confirmed a fatal flaw in Dr. Burtis's and the developer class expert's analysis of [redacted] Ex. 2 (Singer Reply) ¶ 122 & n.248 (citing Ex. 11 (Scalise Dep.) at 269:9-21). Google fails to note this testimony.

2. Focal-Point Pricing Does Not Undermine Dr. Singer's Model

Google incorrectly claims that focal point pricing undermines Dr. Singer's models of pricing in the but-for world. Unlike in the case cited by Google, there is no "overwhelming evidence" in this case suggesting that "developers would choose to price their apps at focal points ending in 99 cents." *In re Apple iPhone Antitrust Litig.*, 2022 WL 1284104, at *8 (N.D. Cal. Mar. 29, 2022). To the contrary, Dr. Singer provides significant economic analysis suggesting that developers would break from focal point pricing in the but-for world. Even now, developers are already willing to depart from focal point pricing. More than [redacted] of the top paid apps in the Play Store have prices that do not end in ".99." Ex. 2 (Singer Reply) ¶ 26. And until recently, Google imposed a minimum price of $0.99, which would be absent in the but-for world. Google recently lifted that restraint [redacted] showing that developers do not view a price ending in $0.99 as sacrosanct, or even desirable. Ex. 2 (Singer Reply) ¶ 29, & n.58; Ex. 12 (GOOG-PLAY-000355570.R) at -597.R.

Further, in the but-for world, the opportunity to steer consumers to cheaper platforms for in-app purchases would result in departure from focal point pricing to incentivize consumers to switch. Ex. 2 (Singer Reply) ¶ 28; Ex. 3 (Singer Dep.) at 200:7-202:7. Although still constrained by Google's anticompetitive conduct, major developers have departed from focal point pricing to take advantage of their severely limited opportunity to steer with reduced prices. Ex. 1 (Singer Rpt.) at Table 9. Finally, to the extent developers prefer to maintain "supermarket-style" pricing in the but-for world, Dr. Singer's models allow for them to retain prices ending in "9," while still passing savings on to consumers, as is observed in the actual world. Ex. 2 (Singer Reply) ¶ 30 & Figure 3. His impact model produces aggregate overcharges within a category; there are myriad pricing combinations—including those ending in "9"—that add up to his aggregate overcharge.

Dr. Singer considered evidence of focal point pricing in his report and reliably determined that his models were sufficient to calculate damages. Ex. 3 (Singer Dep.) at 203:6-206:8.

3. Dr. Singer Properly Used Google's App Categories

Record and economic evidence support Dr. Singer's use of Google's app categories. Contrary to Google's claim, the logit model does not require that all apps within a category are perfect substitutes. Ex. 3 (Singer Dep.) 158:6-160:1 (noting "it's not necessary" to determine which apps are substitutes "to get the implied pass-through rate."). While it "is generally the case" that goods in a logit demand system are substitutes, this does not imply that all goods are interchangeable. *Id*. Economic literature confirms that logit allows for extensive product differentiation, while recognizing that consumers are likelier to shift to goods seen as near-substitutes. Ex. 2 (Singer Reply) ¶ 77; Ex. 13 (Simon Anderson & Andre de Palma, *The Logit as a Model of Product Differentiation* 44 OXFORD ECONOMIC PAPERS 51-67 (1992)) at 53 (noting "there are many characteristics of products which consumers value differently"); Ex. 8 (Train) at 47 (describing "proportionate shifting").

Record evidence shows that Google's app categories are economically reasonable groupings of consumer preferences. Ex. 2 (Singer Reply) ¶¶ 75-77. Google publicly tells developers that "Categories and tags help users to search for and discover the most relevant apps in the Play Store," Ex. 2 (Singer Reply) ¶ 75, and [redacted] *E.g.*, Ex. 14 (GOOG-PLAY-000579868.R) at -870.R; Ex. 2 (Singer Reply) ¶ 75 (compiling

[redacted] Developers are incentivized to categorize their apps with the apps of their competitors to lead consumers to their apps; it would make no sense for a developer to place its app in a category of apps that do not relate to it. Google itself recognizes that [redacted] [redacted]" *Id.* ¶ 76; Ex. 15 (GOOG-PLAY-000303918.R) at -926.R.

Dr. Singer's regressions—which confirmed the logit model fits the data—are strong independent evidence that the app categories used by Google in its ordinary course of business appropriately defined the scope of substitution possibilities for app users. The logit model would only fit the data if there were some substitution between the apps in the chosen categories—and here, Dr. Singer's regressions, which were calibrated to the app categories, determined that the "logit demand model explains the vast majority (more than 85 percent) of the variation" in the demand for Apps and In-App Content in the real world. Ex. 2 (Singer Reply) ¶ 70; Ex. 1 (Singer Rpt.) ¶ 238. In other words, as an app developer's price increased, its share within the category declined following the logit model's predicted demand curve.

The record and Dr. Singer's confirmatory regressions establish that any assumptions he made in using Google's app categories as an input in his model were reliable and appropriate. To the extent Google thinks otherwise, that can be a cross issue. *See Blood Reagents Antitrust Litig.*, No. 09-2081, 2015 WL 6123211, at *14 (E.D. Pa. Oct. 19, 2015) (admitting expert testimony reliant upon assumption about business model with "some support for those assumptions in the record" because any weaknesses "bear on the weight of the evidence rather than admissibility").

D. Dr. Singer Properly Disclosed the Basis for his Pass-Through Analysis

Dr. Singer has properly disclosed the basis for his pass-through analysis. Google's motion faults Dr. Singer solely for not disclosing calculations testing two alternative demand curves to the logit model. Mot. at 13. But Google ignores that the expert stipulation and order in this case requires disclosure only of data "***relied upon*** by the expert witness as a basis for the expert witness's opinion(s)." Dkt. 55 ¶¶ 4, 7 (emphasis added); *contrast with* Mot. at 13 (quoting "considered by an expert" standard); *see also Chinitz v. Intero Real Estate Servs.*, No. 18-cv-05623-BLF, 2020 WL 7391299, at *4 (N.D. Cal. July 22, 2020) (noting that the default Rule 26(a) "considered" standard is significantly broader than a "relied upon" standard). Dr. Singer clearly testified that

while he tested other demand curves, he did not describe them in his report "[b]ecause I ultimately didn't rely on them." Ex. 3 (Singer Dep.) 152:22-153:12. And, in any event, Google's experts have all the data they need to run alternative regressions themselves and doing so would have led them to the same conclusion—that the logit model best fits the data. Ex. 3 (Singer Dep.) 174:17-25.[6]

III. Dr. Singer's Formula For Calculating Google's Competitive Take Rate Is Reliable

Dr. Singer's calculation of Google's competitive take rates is reliable. Google raises only two criticisms of Dr. Singer's modeling—that it relies on his pass-through calculations and that it yields allegedly "absurd results." Mot. at 13-14. Neither is availing.

First, as explained above, *supra* Part II, Dr. Singer's pass-through calculations are reliable. And even assuming Dr. Singer's pass-through calculations were flawed (which they are not), pass-through is just one of many inputs to the econometric models Dr. Singer used to determine competitive take rates. Ex. 1 (Singer Rpt.) Tables 3 & 5. Criticisms with one variable are not grounds for exclusion of an expert's testimony. *See Victorino v. FCA US LLC*, 2018 WL 2767300, at *3 ("Under Rule 702 and Daubert, the proper analysis is not whether some of the inputs can be questioned…"); *Bazemore v. Friday*, 478 U.S. 385, 400, (1986) ("Normally, failure to include variables will affect the analysis' probativeness, not its admissibility.").

Second, Dr. Singer's model does not predict service fees too low to cover Google's marginal costs, as Google claims. Dr. Singer "conservatively estimated" Google's marginal costs at [redacted] but estimated that the actual figure could range [redacted] Ex. 1 (Singer Rpt.) ¶¶ 87 & n. 183, 192 n.388, 212. Neither the 10% fee for Entertainment apps, nor the 9.7% fee for Music and Audio apps falls below the range of estimates of Google's marginal costs. *Id.* at Table 14. Moreover, that Google's rates in 2 of 35 categories fall close to Google's marginal costs does not mean Google could not "anticipate any profit in the foreseeable future." Mot. at 14 (quoting *Apple iPhone Antitrust Litig.*, 2022 WL 1284104, at *5). Google does not (and cannot) contend that the

[6] Google's belated invocation of Rule 26 alone shows lack of prejudice. *W.L. Gore & Assocs., Inc. v. C.R. Bard, Inc.*, No. CV 11-515-LPS-CJB, 2015 WL 12806484, at *4-5 (D. Del. Sept. 25, 2015) (noting that delayed Rule 26 motion "embed[ed] … in its *Daubert* motion" "seriously undermines its contention that there was a lack of disclosure here that has caused it prejudice.")

Play business would be unprofitable under Dr. Singer's model—and the fact that Google may make more money distributing some app categories than others is unsurprising.[7]

IV. Dr. Singer's Use of Averages in Calculating Consumer Impact Is Reliable

Finally, Google argues that Dr. Singer's consumer impact calculations are unreliable because he employs average take rates and pass-through rates. Mot. at 14. But far from obscuring differences between class members or leading to incorrect conclusions, an average take rate across developers accurately reflects market conditions. In the actual world, Google has consistently used uniform and formulaic take rate structures. Ex. 2 (Singer Reply) ¶¶ 7-10. There is no reason to expect that Google would radically depart from this practice and individually negotiate take rates for thousands of developers, developer-by-developer, in the but-for world. *Id.* ¶ 10.

With respect to the pass-through rates, Dr. Singer does not assume "that all apps in the same category would reduce prices by the same proportion," Mot. at 14. Dr. Singer did in fact calculate the pass-through rate on the *individual* app level, based on each app's share of the category, before presenting the average levels in summary. Ex. 3 (Singer Dep.) 130:22-25. Using the same methodology, he could easily calculate pass-through at the app level if necessary for his final damages calculation. *Id.* at 393:11-394:11. But Google has not suggested why an average is unreliable in this context, and there is nothing inherently wrong with the use of averages in calculations in a class action or any other case. *See Tyson Foods, Inc. v. Bouaphakeo*, 577 U.S. 442, 454-55 (2016) (admissibility of representative or statistical evidence turns on "degree to which the evidence is reliable"); *Olean Wholesale Grocery Coop., Inc. v. Bumble Bee Foods LLC,* 31 F.4th 651, 665, 677 (9th Cir. 2022) ("Plaintiffs frequently offer expert evidence, including statistical evidence or class-wide averages, to prove that they meet the prerequisites of Rule 23(b)(3)."); *Optical Disk Drive Antitrust Litig.*, 2016 WL 467444, at *10 (finding that "the appropriate degree to which data should be aggregated to derive reliable results fall on the 'merits' side of the line").

CONCLUSION

The Court should deny Google's motion to exclude the opinions of Dr. Singer.

[7] Indeed, Google has already shown [redacted] Ex. 7 (Burtis Rpt.) ¶ 64 n.45 ([redacted] Ex. 16 (GOOG-PLAY-010736506) ([redacted]

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CERTIFICATE OF SERVICE

The undersigned certifies that a true and correct copy of the foregoing was served on June 23, 2022 upon all counsel of record via the Court's electronic notification system.

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